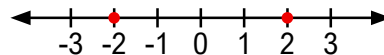


TOPIC: ABSOLUTE VALUE EQUATIONS

Solving Absolute Value Equations

◆ Recall: The absolute value of a number is its _____ from 0.

► For example, $|2| = 2$ and $|-2| = 2$ because both are 2 units from 0.



New

Solving Absolute Value Equations

(A)

$$|x| = 2$$



(B)

$$|x + 1| = 2$$



If $a > 0$ and $|X| = a$, then $X = a$ or $X = -a$.

◆ Always _____ the absolute value before solving.

EXAMPLE

Solve the following absolute value equation below.

$$|x + 1| + 3 = 5$$

TOPIC: ABSOLUTE VALUE EQUATIONS

Solving Absolute Value Equations Special Cases

◆ If a positive and $|X| = a$, then $X = a$ or $X = -a$. We have different rules when a is ____ or ____.

EXAMPLE

Solve the following absolute value equations.

(A) $|x + 1| = 0$

New

If $|X| = 0$, then $X = \underline{\hspace{1cm}}$.

(B) $|x| = -2$

New

If $a < 0$, then $|X| = a$ has ____ solution.

PRACTICE

Solve the following equations.

(A) $2|x| = 10$

(B) $|3x - 5| - 6 = 2$

(C) $0.4|3y + 2| = 3.6$

PRACTICE

Solve the following equations with absolute value.

(A) $3|4x + 1| + 7 = 2$

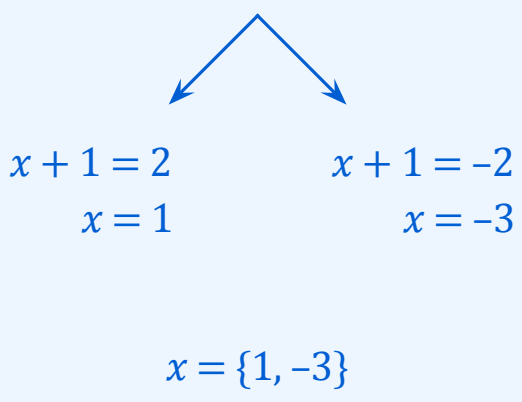
(B) $5|6x - 9| + 3 = 3$

TOPIC: ABSOLUTE VALUE EQUATIONS

Solving Equations Involving 2 Absolute Values

◆ Recall: To solve an equation with **1** absolute value $|X| = a$, rewrite as $X = a$ and $X = -a$ and solve both cases.

► To solve an equation with **2** absolute values $|X| = |Y|$, rewrite as $X = \underline{\hspace{1cm}}$ and $X = \underline{\hspace{1cm}}$ and solve both cases.

Recall	Equation with 1 Absolute Value	New	Equation with 2 Absolute Values
	$ x + 1 = 2$  $x + 1 = 2$ $x = 1$ $x + 1 = -2$ $x = -3$ $x = \{1, -3\}$		$ x + 1 = 2x - 4 $ 

PRACTICE

Solve the following equations with 2 absolute values.

(A)

$$|3x + 4| = |-2x + 7|$$

(B)

$$\left| \frac{2x - 3}{4} \right| = \left| x + \frac{1}{2} \right|$$

TOPIC: ABSOLUTE VALUE EQUATIONS

EXAMPLE

Solve the following equations with 2 absolute values.

(*A*)

$$|3x + 4| = |-8|$$

(*B*)

$$|2x - 4| = |2x + 3|$$

(*C*)

$$|x - 3| - |3x - 9| = 0$$